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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
QIN, YIXING	
ART UNIT	**PAPER NUMBER**
2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/875,015	SHIRAI, MASANARI	
	Examiner	Art Unit	
	Yixing Qin	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *07 March 2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Objections

Claims 1 and 8 are objected to because of the following informalities: the word "overlaping" is misspelled in line 19 of claim 1 and line 20 of claim 8. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

I. Claims 1-3, and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Fukuchi et al (U.S. Patent No.4,994,853).

Fukuchi et al discloses an image recording apparatus that can have interchangeable cartridges with multiple developing sleeves used to create black and white or color images.

1. Claims 1 and 8

A developing device (image forming apparatus) comprising:

- **a first developer carrying member for carrying a developer to develop a latent image formed on an image bearing member;**

- Fukuchi et al discloses in Fig. 3 a diagram of the developing unit of their invention. Furthermore, Fukuchi et al discloses in column 8, lines 57-60 that "...the developing unit [is where] developing devices 31X, 31Y, and 31Z are mounted..." Fukuchi et al discloses in column 3, lines 22-31, a variety of cartridges with varying number of developing sleeves. In Fig. 3, they are showing the one with three colors (Y, M and C). Any of these three developing devices (31X, 31Y, or 31Z) can be read as the "**first developer carrying member**."
- Fukuchi et al also discloses in Fig. 3 (item 30) and column 8, lines 60-63, that "[t]he developing unit 3A is a box, having an opening on the side of photoreceptor drum 30..." One would understand that this photoreceptor drum is the "**image bearing member.**"
- **a first regulating member, disposed on one end of a longitudinal direction of said image bearing member, for regulating a gap between said image bearing member and said first developer carrying member;**
- Fukuchi et al also discloses in Fig. 3 (item 39) and column 8, lines 60-67 and column 9, lines 1-2 that "...there are provided guide members 39, consisting of rollers, etc. [These] guide members 39...are also pressed against the side of the photoreceptor drum 30 by the energized elastic members, 32...thereby maintaining the established gap between developing sleeve 313 (see Fig. 2) and photoreceptor drum 30." From Fig. 3 of Fukuchi et al, one can see that there are three guide members (item 39), any of the three can be "**a first regulating**

member." One can see from Fig. 3 and would understand that the guide members 39 are arranged in a "**longitudinal direction**."

- **a second developer carrying member for carrying a developer to develop the same latent image formed on said image bearing member;**
- Again, any two of the three developing devices (31X, 31Y, or 31Z) can be read as the "**second developer carrying member**," given that the other developing sleeve is the "**first developer carrying member**."
- **and a second regulating member, disposed on said one end of said longitudinal direction of said image bearing member, for regulating a gap between said image bearing member and said second developer carrying member,**
- Again, from Fig. 3 of Fukuchi et al, one can see that there are three guide members (item 39), any of the two of the three can be "**a second regulating member**" given that the other guide member is "**a first regulating member.**" One can see from Fig. 3 and would understand that the guide members 39 are arranged in a "**longitudinal direction**."
- **wherein said first regulating member and said second regulating member are disposed without overlapping each other in said longitudinal direction.**
- From Fig. 3, none of the guide members 39 touch or overlap each other. Again, one can see from Fig. 3 and would understand that the guide members 39 are arranged in a "**longitudinal direction**."

2. **Claims 2 and 9**

The device (apparatus) according to claim 1 (8), wherein

- **the same latent image formed on said image bearing member is developed by said first developer carrying member, and subsequently developed by said second developer carrying member.**
- Fukuchi et al discloses in column 4, lines 27-53 the process for recording a color image. Especially in lines 51-53, Fukuchi et al discloses that "[the] Magenta (M) toner image is formed under the presence of the above described Yellow (Y) toner image, which had already been formed." This indicates that the image is being developed by both a first and second developer.

3. **Claims 3 and 10**

The device (apparatus) according to claim 2 (9), wherein

- **the developer on said second developer carrying member has a layer thickness regulated in a gap between said first developer carrying member and said second developer carrying member.**
- Fukuchi et al discloses in column 5, lines 6-14 that "...the residual toner remaining on the image carrier 30, from the drum surface of which the recording paper was separated, will be cleaned by bringing the blade 59A of the above cleaning device 59 into contact with the surface of the image carrier drum 30.

Upon completion of such cleaning, the blade 59A is separated from the peripheral surface of the drum, and the image carrier 30 enters freshly into the next color image forming process." The cleaning of the residual toner is a regulating mechanism that ensures that the thickness of the toner of a certain color on the image carrier (or photoreceptor drum 30) is at an acceptable level.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

II. Claims 4-7 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuchi et al (U.S. Patent No.4,994,853) in view of Fujii (U.S. Patent No. 5,229,821)

The Fujii reference discloses an image forming apparatus with a detachable cartridge.

4. Claims 4 and 11

The device (apparatus) according to claim 3 (10), wherein

- **a rotation direction of said first developer carrying member is the same as a rotation direction of said second developer carrying member.**

- Although the Fukuchi et al reference discloses in Fig. 2 a direction in which the photoreceptor drum 30 rotates (as seen by the arrow), it does not explicitly disclose the direction in which the developing members 31X, 31Y, and 31Z spin. Although, it can be inferred that they rotate in the same direction since (or seen in Fig. 2, which also applies to Fig. 3) developing sleeve 313 picks up developer "D" and passes 317 to limit the amount picked up (column 8, lines 36-50 and column 7, lines 63-68). Thus, it would appear that 313 (and, similarly, 31X,Y,Z) would rotate in a counter-clockwise direction (even though this is not explicitly stated.)
- However, the secondary reference, Fujii, discloses in column 3, lines 39-41 that "[t]he developing units 10Y, 10M, 10C and 10BK contain a yellow toner, a magenta toner, a cyan toner and a black toner, respectively, each have a developing roller 11." ("**developer carrying member**") One can see from the arrows in Fig. 1 of Fujii that the developing rollers all rotate in the same direction.
- Since both references are in the art of producing colored images, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the rollers roll in the same direction. The motivation would be to ensure that the rollers move in a common direction to prevent the dropping of toner in an incorrect manner on an image bearing member (drum).

5. Claims 5 and 12

The device (apparatus) according to claim 4 (11), wherein

- **a movement direction of surface of said first developer carrying member and said second developer carrying member is the same as a movement direction of a surface of said image bearing member in a developing portion.**
- Again, although the Fukuchi et al reference discloses in Fig. 2 a direction in which the photoreceptor drum 30 rotates (as seen by the arrow), it does not explicitly disclose the direction in which the developing members 31X, 31Y, and 31Z spin. Also, please see the discussion above. However, the secondary reference, Fujii, discloses in Fig. 1 that a photosensitive drum 3 (column 3, line 30) spins in the same downwards direction as the developing rollers 11 at the point of contact as indicated by the arrows, even though the rollers rotate in a counterclockwise and the drum rotates at a clockwise direction. The direction of movement of the rollers 11 and the drum 3 is the same as those seen in the applicant's drawing in Fig. 1.
- Since both references are in the art of producing colored images, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the rollers and drums in Fukuchi et al's invention to rotate in the same direction as disclosed by the Fujii reference. The motivation would be so that toner can be properly applied to the drum.
- Also, it is important to point out that when two wheels (i.e. a roller and a drum) rub again each other, there is either an upward or a downward force on both wheels at the point of contact. The natural movement would be for one wheel to

spin in a counterclockwise manner, and the other in a clockwise manner (thus, naturally, there would be the same direction of movement at the point of contact between a roller and a drum). If both rotated in the same manner, there would be opposing forces on the wheels at the point of contact, which leads to increased friction and overheating.

6. Claims 6 and 13

The device (apparatus) according to claim 5 (13), wherein

- **a peripheral speed of said first developer carrying member and said second developer carrying member is higher than a peripheral speed of said image bearing member in said developing portion.**
- Fukuchi et al discloses in column 6, 40-55 the dimensions of the photoreceptor drum and the various developing devices 31X, 31Y and 31Z. Lines 40-41 discloses that "[i]n the present embodiment a photoreceptor drum of 110 mmϕ has been used." Lines 42-55 (in particular lines 45-47, that the "developing device could be adequately reduced to around 30 mm or less by reducing the outer dimension of the developing sleeve to 20 mmϕ .
- Common mechanics shows that if two wheels were to come in contact with each other, the smaller wheel would move faster than the larger wheel because it needs more rotations to cover the same amount of distance moved because of its smaller circumference. From Fukuchi et al's explanation of his invention and

his figures, one can see that the drum 30 is a larger wheel than the developing devices 31X, 31Y, 31Z.

7. Claims 7 and 14

The device (apparatus) according to any one of claims 1 to 6 (8 to 13), wherein

- **said first regulating member and said second regulating member abut on said image bearing member.**
- Fukuchi et al discloses in column 4, lines 27-53 the process for recording a color image. One would understand that in order to form the image on the drum's surface, the developing devices 31X, 31Y, 31Z, would have to come in contact with the drum so that toner can be transferred.

III. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuchi et al (U.S. Patent No.4,994,853) in view of Nuzum (U.S. Patent No. 3,575,139)

The Nuzum reference discloses a gating apparatus for electrostatic printing machines.

15. A developing device comprising:

- **a first developer carrying member, rotatably supported by a main body of said developing device, for carrying a developer to develop a latent image formed on an image bearing member;**

- **a first regulating member, disposed on one end of a longitudinal direction of said image bearing member, for regulating a gap between said image bearing member and said first developer carrying member;**
- **a second developer carrying member for carrying a developer to develop the same latent image formed on said image bearing member;**
- **a second regulating member, disposed on said one end of said longitudinal direction of said image bearing member, for regulating a gap between said image bearing member and said second developer carrying member;**
- The above four limitations have been addressed in the rejection to claims 1 and 8 above by the Fukuchi et al reference. Also, Fig. 1-a and 1-b of Fukuchi et al discloses an entire view of the printing device in Fukuchi et al's invention. One can see it has a main body and would understand that it supports the rotation of the developers (31X, Y, Z) and image bearing member (30).
- **and a rocking member for pivotally moving said second developer carrying member about a portion near an end of said first developer carrying member, said rocking member pivotally supporting said second developer carrying member.**
- Although the Fukuchi et al reference discloses a plurality of rollers and the use of elastic members 32 to press the rollers against a drum (column 8, lines 63-67) , it does not disclose there is a rocking member. However, the rocking member can be an alternative to the elastic members 32 since they would serve the same

purpose as the elastic members (which is to push the rollers against the drum to apply toner).

- The secondary reference, Nuzum discloses in column 4, lines 38-48 the process of the gating action taken by the invention to prevent the dropping of toner on a developing section Z (Fig. 2).
- Nuzum also discloses in column 4 in column 4, lines 61-75 that "[g]ating action of the other magnetic brush 40 (notice in Fig. 2 that there is a first brush, 39 and a second brush 40) is provided by the quick rotation of the magnet 46 for approximately 90 degree from its illustrated position. As previously stated, the magnet 46 is provided with a shaft 48 that extends externally of the developer housing 36. As shown in FIG. 2, the shaft 48 is rotatably connected to a rocker arm 67 which has a pin 68 extending therefrom at one end to be engaged by a rocker arm 69 arranged to be swung in either direction upon activation of a rotary solenoid SOL-1. " Items 67, 68 and 69 are in Fig. 3 of Nuzum.
- Since both references are in the art of printing and providing methods of the prevention of over-depositing toner, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a gating (rocking member) mechanism from Nuzum's invention in Fukuchi et al's invention. The motivation would be have a mechanism to prevent unwanted toner from being deposited.

16. The device according to claim 15, further comprising

- **pressing means for pressing said rocking member toward said image bearing member.**
- As mentioned above in the rejection to claim 15, the rocking of the rocker arm 69 can swing the rocker arm 67 in either direction. One direction would be to direct the brush away from the image bearing member (development zone, item Z in Fig. 2 of Nuzum). The other would be to direct the brush towards the development zone **(i.e. press rocker towards the image bearing member)**

17. **The device according to claim 15, further comprising**

- **a gap regulating member for regulating a gap between said first developer carrying member and said second developer carrying member.**
- Fukuchi et al also discloses in Fig. 3 (item 39) and column 8, lines 60-67 and column 9, lines 1-2 that "...there are provided guide members 39, consisting of rollers, etc. [These] guide members 39...are also pressed against the side of the photoreceptor drum 30 by the energized elastic members, 32...thereby maintaining the established gap between developing sleeve 313 (see Fig. 2) and photoreceptor drum 30." The guide members and elastic members serve to regulate the gap between the rollers and drum and between rollers only.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yixing Qin whose telephone number is 703-306-4142. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Coles can be reached on 703-305-4712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YQ

Joseph R Pokrzywa

JOSEPH R. POKRZYWA
EXAMINER
ART UNIT 2622